REMARKS/ARGUMENTS

Applicant appreciates the thorough examination of the present application, as evidenced by the first Official Action. Applicant also appreciates the indication that dependent Claims 3, 15, 16, 23 and 24 are allowable. Nonetheless, the first Official Action rejects Claims 1, 2, 4-6, 9, 10, 13, 14 and 19-22 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,283,788 to Tamburelli; and rejects Claims 7, 8, 11, 12, 17 and 18 as being unpatentable over the Tamburelli patent in view of the publication: D. Muñoz-Rodriguez, *Code Interleaving for High Speed Digital Transmission.* In addition, the Official Action objects to the Abstract of the Disclosure section and dependent Claims 18 and 19 as including typographical errors.

In response to the first Official Action, Applicant has amended the Abstract of the Disclosure section and dependent Claims 18 and 19 to correct inadvertent typographical errors. Applicant has not amended any of the claims in response to the rejections of those claims as being unpatentable over the Tamburelli patent, alone or in combination with the Muñoz-Rodriguez publication, and accordingly traverses the rejections of those claims. As explained below, Applicant respectfully submits that the claimed invention of the present application is patentably distinct from the Tamburelli patent and the Muñoz-Rodriguez publication, taken individually or in combination. In view of the remarks presented below, Applicant respectfully requests reconsideration and allowance of all of the pending claims of the present application.

A. The Official Action Fails to Establish Prima Facie Obviousness

Initially, Applicant respectfully submits that the Official Action fails to establish *prima facie* obviousness of the claimed invention. As stated in the MPEP, establishing *prima facie* obviousness of a claimed invention requires some suggestion or motivation to modify the references or to combine reference teachings." MPEP at § 2143.01. The Official Action alleges that one skilled in the art would find it obvious to modify the Tamburelli system as a design choice based on system characteristics, and then alleges that the motivation for such a modification would be based upon those system design requirements. However, as stated in the MPEP, "the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." *Id.*

(citing *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990)) (emphasis in original). In addition, as has been held by the Board of Patent Appeals and Interferences, and noted in the MPEP, the mere fact that one skilled in the art could adapt the reference device to meet the terms of a claim is not by itself sufficient to support a finding of obviousness. The prior art must also provide a motivation or reason for one skilled in the art, without the benefit of applicant's specification, to make the necessary modifications to the reference device. MPEP 2144.04(VI.)(C.) (*citing Ex parte Chicago Rawhide Mfg. Co.*, 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984). Thus, Applicant respectfully submits that circularly asserting that it would be a design choice to modify the Tamburelli system, and that one skilled in the art would be so motivated because of the design choice, does not by itself render obvious the claimed invention of independent Claim 20.

B. Claims 1, 2, 4-6, 9, 10, 13, 14 and 19-22 are Patentable over Tamburelli

The primary reference, the Tamburelli patent, provides an equalization system for eliminating precursor and postcursor interference effects from an incoming train of digital pulses. As disclosed, the system includes a preshaping filter FP connected at an input to the receiving end of a transmission path and at an output to an equalizer EQ. The filter FP includes a compensation-signal generator CS formed as a differentiating circuit, where the differentiator CS includes a capacitor C connected between a transmission lead and a grounded variable resistor R. As insertion of the filter FP upstream of the equalizer can increase the noise in an arriving signal, the system can further include a filter FR upstream of filter FP. As disclosed, the filter FR may be a conventional filter reducing the bandwidth of the transmitted signal train. Such a reduction may increase the distortion of the pulses, but this distortion can be easily compensated by the action of filter FP and equalizer EQ.

As embodied in independent Claim 20, the claimed invention of the present application provides a digital communications system including a transmitter and a receiver. As recited, the transmitter is capable of integrating at least one encoded digital signal by converting the encoded digital signal into an integrated signal that is proportional to the time integral of the encoded digital signal. The transmitter is then capable of transmitting the integrated signal. In turn, the receiver is capable of receiving the integrated signal and thereafter differentiating the integrated

signal into a representation of the encoded digital signal that is proportional to the rate of change of the at least one integrated signal.

In contrast to the claimed invention, the Tamburelli patent does not teach or suggest a transmitter and receiver capable of performing the recited integrating and differentiating functions. In fact, the Official Action concedes that the Tamburelli patent does not disclose converting an encoded digital signal into an integrated signal that is proportional to the time integral of the encoded digital signal, or differentiating the integrated signal into a representation of the encoded digital signal that is proportional to the rate of change of the at least one integrated signal, as recited by independent Claim 20. Nonetheless, the Official Action alleges that the recited characteristics of the integrated signal and representation of the encoded digital signal are design choices based upon system characteristics, and that it would have been obvious to one skilled in the art to so modify the Tamburelli system to include those characteristics based upon system design requirements. In contrast to the assertions of the Official Action, however, Applicant respectfully submits that not only does the Tamburelli patent not teach or suggest an integrator capable of integrating at least one encoded digital signal by converting the encoded digital signal into an integrated signal, the recited characteristics of the integrated signal and representation of the encoded digital signal are not obvious design choices.

1. Tamburelli Patent Does Not Teach/Suggest Claimed Integrator

As indicated above, the system of independent Claim 20 includes an integrator capable of integrating at least one encoded digital signal by converting the encoded digital signal into an integrated signal. In rejecting independent Claim 20, the Official Action alleges that the disclosed filter FR corresponds to the claimed integrator, with the filter FR being interpreted as a low pass filter similar to a non-ideal integrator approximated as a low pass filter. As disclosed by the Tamburelli patent, however, the FR filter comprises a conventional filter for reducing the bandwidth of a transmitted signal train. Column 4, line 66 – column 5, line 2. Accordingly, Applicant respectfully submits that one skilled in the art would more readily interpret such a bandwidth reducing filter as bandpass filter and not, as alleged, a low pass filter, much less a low pass filter configured to integrate an encoded digital signal as is the claimed integrator.

2. Recited Characteristics Not a Design Choice

Irrespective of whether the Official Action established prima facie obviousness of the claimed invention, or whether the disclosed filter FR reasonably corresponds to the claimed integrator, Applicant respectfully submits that, in contrast to the assertion of the Official Action, the recited characteristics of the integrated signal and representation of the encoded digital signal are not mere design choices based upon system characteristics. As guidance on this issue, consider the case of *In re Chu*, 66 F.3d 292 (Fed. Cir. 1995), in which a claimed invention was directed to an apparatus for controlling emissions of fossil fuel that included a selective catalytic reduction (SCR) catalyst positioned inside the fabric filter bag of a jet fabric filter house. The Examiner and the Board of Patent Appeals and Interferences in *In re Chu* cited prior art directed to an apparatus that included an SCR catalyst positioned downstream of a fabric filter house, and that modifying the prior art apparatus as in the claimed invention was merely a "design choice." The Federal Circuit disagreed, however, finding that placement of the SCR catalyst within the bag retainer was not merely a "design choice." 66 F.3d at 299. In holding the claimed invention unobvious over the cited prior art, the Federal Circuit found that the prior art did not include any teaching or suggestion that would lead one of ordinary skill in the art to modify the disclosed apparatus to obtain the claimed invention. In addition, the Federal Circuit cited evidence on the record suggesting that modifying the disclosed apparatus to include the SCR catalyst within the bag retainer of a fabric filter, as in the claimed invention, would require other modifications of the disclosed apparatus to accommodate the frailties of fabric filters, those modifications not being taught or suggested by the prior art. The Federal Circuit found that this evidence clearly countered the assertion that replacement of the SCR catalyst is merely a "design choice." *Id.*; and *see In re Gal*, 980 F2d 717 (Fed. Cir. 1992) (finding of "obvious design choice" precluded where the claimed structure and the function it performs are different from the prior art).

In the instant case, like in *In re Chu*, Applicant respectfully submits that the cited prior art, including the Tamburelli patent, does not teach or suggest a motivation for one skilled in the art to modify the Tamburelli system such that the disclosed elements operate in a manner similar to the integrator and differentiator of the claimed invention. In addition, Applicant respectfully submits that the function performed by the elements of the claimed invention differ from those

performed by the allegedly corresponding elements of the Tamburelli system. In this regard, Tamburelli patent discloses that the filter FR alleged to correspond to the integrator functions to reduce the bandwidth of a transmitted signal train. The integrator of the claimed invention, on the other hand, functions to convert an encoded digital signal into an integrated signal that is proportional to the time integral of the encoded digital signal. As such, Applicant respectfully submits that configuring an integrator to convert an encoded digital signal into an integrated signal that is proportional to the time integral of the encoded digital signal, and configuring a differentiator to differentiate the integrated signal into a representation of the encoded digital signal that is proportional to the rate of change of the at least one integrated signal, is not merely an obvious design choice.

For at least the reasons explained above, Applicant respectfully submits that the claimed invention of independent Claim 20, and by dependency Claims 21-24, is patentably distinct from the Tamburelli patent. Applicant also respectfully submits that independent Claims 1, 10 and 14 recite subject matter similar to that of independent Claim 20. In this regard, independent Claims 1 and 10 recite integrating an encoded signal by converting the signal into an integrated signal that is proportional to the time integral of the encoded signal. Similarly, independent Claims 1 and 14 recite differentiating the integrated signal by converting the integrated signal into a representation of the encoded signal that is proportional to the rate of change of the integrated signal. As such, Applicant respectfully submits that the claimed invention of independent Claims 1, 10 and 14, and by dependency Claims 2-9, 11-13 and 15-20, is also patentably distinct from the Tamburelli patent, for at least the same reasons given above with respect to independent Claim 20. Applicant therefore respectfully submits that the rejection of Claims 1, 2, 4-6, 9, 10, 13, 14 and 19-22 under 35 U.S.C. § 103(a) as being unpatentable over the Tamburelli patent is overcome.

B. Claims 7, 8, 11, 12, 17 and 18 are Patentable over Tamburelli/Muñoz-Rodriguez

The first Official Action also rejects Claims 7, 8, 11, 12, 17 and 18 as being unpatentable over the Tamburelli patent in view of the Muñoz-Rodriguez publication. Similar to the Tamburelli patent, Applicant respectfully submits that the Muñoz-Rodriguez publication does

not teach or suggest integrating an encoded signal by converting the signal into an integrated signal that is proportional to the time integral of the encoded signal, or differentiating the integrated signal by converting the integrated signal into a representation of the encoded signal that is proportional to the rate of change of the integrated signal, as recited by independent Claims 1, 10, 14 and 20. Accordingly, as neither the Tamburelli patent nor the Muñoz-Rodriguez publication teach or suggest the aforementioned features of the claimed invention, the combination of the Tamburelli patent and Muñoz-Rodriguez publication teach or suggest those features. Applicant therefore respectfully submits that the claimed invention of independent Claims 1, 10, 14 and 20, and by dependency Claims 2-9, 11-13, 15-20 and 21-24, is patentably distinct from the Tamburelli patent and Muñoz-Rodriguez publication, taken individually or in combination. And as such, Applicant submits that the rejection of Claims 7, 8, 11, 12, 17 and 18 under 35 U.S.C. § 103(a) as being unpatentable over the Tamburelli patent in view of the Muñoz-Rodriguez publication is overcome.

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Amdt. dated 07/01/2005
Reply to Official Action of April 4, 2005

CONCLUSION

In view of the amendments to the specification and claims, and the remarks presented above, Applicant respectfully submits that the present application is in condition for allowance. As such, the issuance of a Notice of Allowance is therefore respectfully requested. In order to expedite the examination of the present application, the Examiner is encouraged to contact Applicant's undersigned attorney in order to resolve any remaining issues.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

Andrew T. Spence
Registration No. 45,699

Customer No. 00826
ALSTON & BIRD LLP
Bank of America Plaza
101 South Tryon Street, Suite 4000
Charlotte, NC 28280-4000
Tel Charlotte Office (704) 444-1000
Fax Charlotte Office (704) 444-1111

CERTIFICATION OF FACSIMILE TRANSMISSION

I hereby certify that this paper is being facsimile transmitted to the US Patent and Trademark Office at Fax No. (703) 872-9306 on the date shown below.

Sarah B. Simmons — July 1, 2005
Date